

***Conodiplostomum asymmetricum* sp. n.**
(Neodiplostomidae: Crassiphialinae), from
***Niviventer cremoriventer* (Muridae) from Yunnan Province of the**
Peoples Republic of China

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ABSTRACT: One of 6 pencil-tailed rats, *Niviventer cremoriventer*, collected from Yunnan Province, Peoples Republic of China, in August 1987, was infected with 5 specimens of an undescribed species of *Conodiplostomum* (Neodiplostomidae). *Conodiplostomum asymmetricum* sp. n. differs from existing species of *Conodiplostomum* in having a larger body size (3,050–3,300 μ m), smaller eggs (65–80 μ m), the forebody shorter than the hindbody, the acetabulum located in the upper $\frac{1}{3}$ of the forebody, and using a mammalian host.

KEY WORDS: *Conodiplostomum asymmetricum*, China, Crassiphialinae, Neodiplostomidae, *Niviventer cremoriventer*, Muridae.

Dubois (1937) divided the genus *Neodiplostomum* Railliet, 1919, into 2 subgenera, *Neodiplostomum* and *Conodiplostomum*. *Conodiplostomum* was elevated to generic status by Sudarikov (1962). *Neodiplostomum* is characterized by the absence of a genital cone and an asymmetrical arrangement of the testes, where the testes are of unequal size, whereas species of *Conodiplostomum* have a genital cone and testes of about the same size. Members of the genus *Fibricola* Dubois, 1932, bear a strong resemblance to species of both *Neodiplostomum* and *Conodiplostomum*. Dubois (1932) separated *Fibricola* from *Neodiplostomum* and *Conodiplostomum* based on the absence of vitelline follicles in the hindbody of species of *Fibricola* and on their specificity for mammals. Several authors have challenged the validity of this separation based primarily on the variability of the distribution of the vitellaria seen in species of *Fibricola* and on observations that suggest species of *Fibricola* are not exclusively mammal parasites (Chandler, 1942; Chandler and Rausch, 1946; Pearson, 1959; Shoop, 1989). Yamaguti (1971) recognized 12 species of the original subgenus *Conodiplostomum* from birds: *C. accipitris* Dubois and Rausch, 1948; *C. acutum* Dubois, 1937; *C. australiense* Dubois, 1937; *C. banghami* Penrod, 1947; *C. brachypteris* Chatterji, 1942; *C. brachyurum* (Nicol, 1914) Dubois, 1937; *C. butasturinum* (Tubanguai, 1932) Dubois, 1936; *C. krausei* Dubois,

1937; *C. palumbarii* Dubois, 1937; *C. perlatum* Ciurea, 1911; *C. sarcorhamphi* Dubois, 1937; and *C. spathula* (Creplin, 1829) La Rue, 1926. Betterton (1976) described *Neodiplostomum conodiplostomum ramachandrani* from *Rattus muelleri* in Malaysia; however, Palmieri et al. (1979) examined additional specimens of this species and transferred it to the genus *Fibricola* Dubois, 1932. Dubois (1985) described *N. C. pitangi* from *Pitangus sulphuratus* in Paraguay. Shoop (1989) used systematic analysis of morphological characteristics and types of metacercariae to redefine the family Diplostomidae Poirier, 1886, and establish 2 new families, Neodiplostomidae and Bolbophoridae. Under this redefinition, members of the genus *Neodiplostomum*, which were previously assigned to the subgenus *Neodiplostomum*, were placed in the subfamily Neodiplostominae (Neodiplostomidae) and those previously assigned to the subgenus *Conodiplostomum* were placed in Crassiphialinae (Neodiplostomidae) under the genus *Conodiplostomum*. The vitelline follicles in Neodiplostominae are restricted to the forebody, a genital cone is lacking, there is a neodiplostomulum-type metacercariae in amphibians, and adults are found in both birds and mammals. The vitelline follicles in Crassiphialinae are distributed in the entire body, or exclusively in the hindbody, a genital cone is present, there is a neascus-type metacercariae in fish, and adults have been reported exclusively from birds.

During a survey of the helminths of mammals from Yunnan Province of the Peoples Republic of China, we found an undescribed species of

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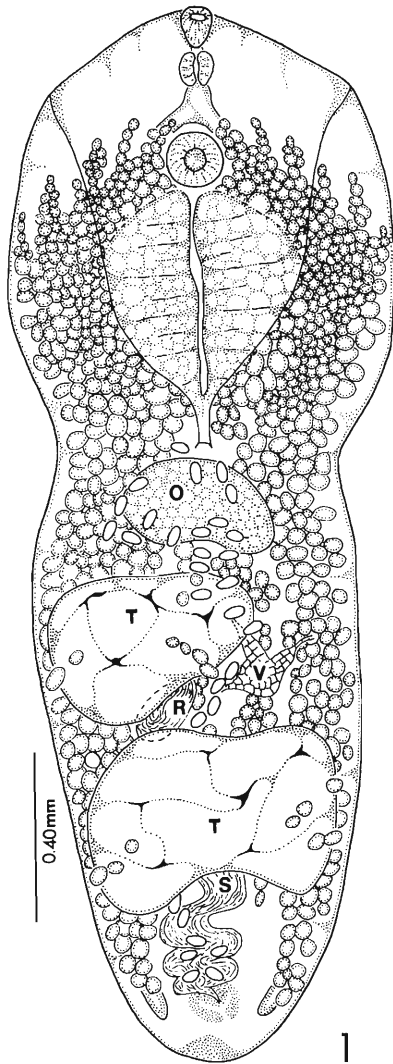


Figure 1. Camera lucida drawing of ventral view of adult *Conodiplostomum asymmetricum* sp. n. (Neodiplostomidae) from *Niviventer cremoriventer* showing the ovary (O), seminal receptacle (R), seminal vesicle (S), testes (T), and vitelline reservoir (V).

Conodiplostomum Sudarikov, 1962, in the pencil-tailed rat, *Niviventer cremoriventer* Miller, 1900.

Materials and Methods

Six specimens of the pencil-tailed rat, *N. cremoriventer*, were collected in August 1987, from Menglun, Yunnan Province, Peoples Republic of China, and examined for helminths. Trematodes were observed alive, fixed in hot alcohol-formalin-acetic acid under slight coverslip pressure, stained in Semichon's carmine, and mounted in Canada balsam. Measurements are in mi-

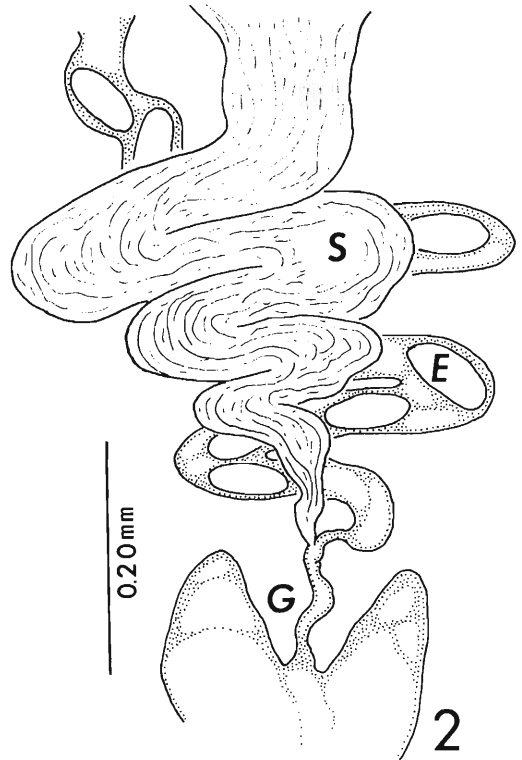


Figure 2. Enlarged view of genital cone region of *Conodiplostomum asymmetricum* sp. n. from *Niviventer cremoriventer* showing eggs in the uterus (E), the genital cone (C), and the seminal receptacle (S).

crometers with the mean followed by the range in parentheses.

Results

One of 6 specimens of *N. cremoriventer* (Muridae) was infected with 5 specimens of *Conodiplostomum asymmetricum* sp. n.

Conodiplostomum asymmetricum sp. n. (Figs. 1, 2)

DESCRIPTION (based on 5 adult specimens):

With characteristics of genus. Body 3,140 (3,050–3,300) long; distinctly divided into a short, finely spined forebody, 1,300 (1,275–1,400) long by 1,175 (1,150–1,200) wide, and a longer, more cylindrical hindbody, 1,840 (1,775–1,900) long by 975 (945–1,010) wide. Oral sucker subterminal, 118 (110–125) long by 100 (95–112) wide. Acetabulum, located $\frac{1}{3}$ the distance down forebody, 145 (128–160) long by 165 (158–168) wide. Ratio of transverse diameter of oral sucker to acetabulum, 1:1.6. Tribocytic organ circular to elliptical, large, 750 (700–810) long by 610 (540–

680) wide, approximately $\frac{1}{2}$ as long as forebody. Prepharynx 8 (2–18) long; pharynx 90 (85–96) long by 83 (80–85) wide; esophagus 20 (15–35) long, bifurcating midway between pharynx and acetabulum; ceca terminating near posterior extremity of hindbody. Testes tandem, in middle third of hindbody. Anterior testis asymmetrical, 560 (530–590) long by 635 (630–640) wide, smaller than posterior testis, 595 (550–640) long by 855 (750–960) wide. Seminal vesicle tubular, highly folded, extending anteriorly from near posterior extremity of hindbody to level of ovary. Copulatory bursa present, not evaginable; genital pore at tip of well-developed genital cone, opening dorsally near posterior end of body. Ovary median, immediately pretesticular, 250 (220–272) long by 470 (420–540) wide. Ootype located at level of anterior testis, near midline of body. Laurer's canal not observed. Vitelline follicles large, densely distributed in forebody and hindbody, extending from cecal bifurcation to near posterior extremity of hindbody. Uterus largely intercecal, confined to hindbody, occupying space between division of forebody and hindbody and genital cone. Eggs small, 74 (65–80) long by 48 (40–60) wide. Excretory pore slightly subterminal on ventral surface.

Taxonomic summary

SPECIMENS DEPOSITED: Holotype: USNM Helm. Coll. No. 84406. Paratypes: USNM Helm. Coll. No. 84407 (1 specimen), Texas Cooperative Wildlife Coll. No. CHI-87-1-3 (2 specimens), Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas.

TYPE HOST: *Niviventer cremoriventer*.

SITE OF INFECTION: Small intestine.

TYPE LOCALITY: Yunnan Province, Peoples Republic of China, 21°55'N, 101°17'E.

ETYMOLOGY: The specific epithet refers to the asymmetrical shape of the anterior testis.

Discussion

Hong and Shoop (1994) emended Neodiplostominae to include species like *Neodiplostomum seoulensis*, which have nearly symmetrical testes, vitellaria distributed in both fore- and hindbodies, pseudosuckers absent, and a reduced genital cone. *Conodiplostomum asymmetricum* sp. n. was collected from a mammal; has an asymmetrical anterior testis, vitelline follicles that are heavily distributed in the fore- and hindbodies and a

well-developed genital cone; and cannot be placed in *Fibricola* or *Neodiplostomum*. Based on these characteristics, we have placed the new species in *Conodiplostomum*. To facilitate placement of *C. asymmetricum* sp. n., the genus *Conodiplostomum* and the subfamily Crassiphialinae, as defined by Shoop (1989), should be emended to include mammalian hosts. *Conodiplostomum perlatus* Ciurea, 1929, is the only other species in the genus in which the anterior testis is smaller than the posterior testis; however, *C. asymmetricum* sp. n. can be distinguished from all species in the genus because it is larger (3,050–3,300), it has a smaller egg size (65–80), the acetabulum is in the upper $\frac{1}{3}$ of the forebody, the forebody is shorter than the hindbody (approximately $\frac{3}{4}$ as long), and it is a parasite of mammals.

Acknowledgments

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